

REMARKS/ARGUMENTS

Claims 1, 12, 18, and 43 have been amended. Claim 12 has been amended to incorporate the limitations of claim 18 and to remove language that the Examiner stated was not supported by the specification. Claims 44 and 45 have been added.

Rejections Under 35 U.S.C. § 112, second paragraph

Claim 1, 2, 4-7, 10-14, 18, and 43 were rejected to under 35 U.S.C. 112, first paragraph, as failing to particularly to comply with the written description requirement. The Examiner stated that regarding claims 1 and 12, the phrase "wherein the portion of the gas distribution plate has substantially no micro defects about 50 micrometers or greater" is not supported by the specification as filed. Claims 1 and 12 have been amended to remove the phrase objected to by the Examiner.

Accordingly, Applicants respectfully submit that all pending claims are sufficiently clear and definite and thus respectfully request withdrawal of the rejection under 35 U.S.C. § 112, first paragraph.

Rejections Under 35 U.S.C. § 102 & 103(a)

Claims 12-14, 18, and 43 stand rejected under 35 U.S.C. §103(a), as obvious, over Maydan (U.S. Patent No. 5,746,875) in view of Aihara I (U.S. 6,258,440) or Aihara II (JP 10-167859). Applicants respectfully traverse.

Claims 1, 2, 4-7, 10-14, 18, 40, and 43 stand rejected under 35 U.S.C. §103(a), as obvious, over Herchen (5,819,434) taken in view of Aihara I (6,258,440) or Aihara II (JP 10-167859). Applicants respectfully traverse.

Claims 1, 2, 4-7, 10-14, 18, 40, and 43 stand rejected under 35 U.S.C. §103(a), as obvious, over Herchen (5,819,434) taken in view of Aihara I (6,258,440) or Aihara II (JP 10-167859) and in further view of Maydan (5,746,875) and Chen (5,824,605). Applicants respectfully traverse.

Claims 1, 2, 4-7, 10-14, 18, 40, and 43 stand rejected under 35 U.S.C. §103(a), as obvious, over Schneider (6,263,829) taken in view of Aihara I (6,258,440) or Aihara II (JP 10-167859). Applicants respectfully traverse.

Claims 1, 2, 4-7, 10-14, 18, 40, and 43 stand rejected under 35 U.S.C. §102(e) as being anticipated by, or in the alternative, under 35 U.S.C. §103(a), as obvious, over Wicker I et al., U.S. Patent No. 5,993,584 (“Wicker I”). Applicants respectfully traverse.

Claims 1-14, 18, and 42 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Wicker I et al., U.S. Patent No. 5,993,584 (“Wicker I”) or Wicker II, U.S. Patent No. 5,863,376 and Chen, U.S. Patent No. 5,824,605, and optionally in further view of the applicants’ description of the prior art. Applicants respectfully traverse.

Regarding the rejection of claim 12 over Maydan in view of Aihara I or Aihara II, claim 12 is not obvious over Maydan in view of Aihara I or Aihara II. Claim 12 has been amended to incorporate the limitations of claim 18 that recite that the annealing is at a controlled temperature between about 1500 degrees C to 1600 degrees C for a time from about 5 to 10 hours subsequent to machining the ceramic surface. Nothing in the references teaches or suggests annealing at a controlled temperature between about 1500 degrees C to 1600 degrees C for a time from about 5 to 10 hours. In addition, it would not be obvious to combine Maydan and Aihara I or Aihara II to obtain the claimed invention. The abstract of Maydan teaches surface polishing, not annealing. Maydan does not teach or suggest the need for further removal of surface damage, there it would not be obvious to combine Maydan with Aihara I or Aihara II. For at least these reasons, claim 12 is not made obvious by Maydan in view of Aihara I or Aihara II.

Regarding the rejection of claim 1 over Herchen in view of Aihara I or Aihara II or in view of Aihara I or Aihara II and in further view of Maydan (5,746,875) and Chen (5,824,605), claim 1 has been amended to recite that the portion includes at least one of Si₃N₄ and SiC. It would not be obvious to provide the invention as recited in claim 1, where the portion is made of at least one of Si₃N₄ and SiC and further annealing after the machining. Aihara I teaches away from annealing a portion made of Si₃N₄ and SiC. Col. 4, lines 8-18, of Aihara I teaches that bodies made of Si₃N₄ and SiC do not have corrosion resistance and therefore the annealing process of Aihara I could not be applied to parts made of such substances. Therefore, Aihara I teaches away from the use of annealed Si₃N₄ and SiC.

In addition, Maydan teaches away from drilled holes for passing process gases to the semiconductor processing chamber. Maydan in col. 1, lines 66 to 67, teaches that holes cause particularly acute problems. Col. 5, line 57, to col. 6, line 5, of Maydan explains that the slotted apertures or nozzles 60 are provided by closely placed block elements 42, 44, 46, and 50 which may be machined as separate pieces and externally polished prior to assembly, which prevent the problems caused by the holes. The full paragraph containing col. 2, lines 3-4, of Maydan teaches that orifices or holes cause particularly acute problems. Although drilled holes may be known, Maydan teaches away from drilled holes. Therefore, it would not be obvious to combine Maydan with the references that teach drilling holes in parts. In addition, it would not be obvious how to provide the polishing of Maydan with parts with drilled holes. The reason Maydan teaches away from drilled holes is that it would be difficult to polish within the holes.

None of the cited references remedy these deficiencies. For at least this reasons claim 1 is not made obvious by Herchen in view of Aihara I or Aihara II or in view of Aihara I or Aihara II and in further view of Maydan (5,746,875) and Chen (5,824,605).

Regarding the rejection of claim 12 over Herchen in view of Aihara I or Aihara II or in view of Aihara I or Aihara II and in further view of Maydan (5,746,875) and Chen (5,824,605), claim 12 has been amended to incorporate the limitations of claim 18 that recite that the annealing is at a controlled temperature between about 1500 degrees C to 1600 degrees C for a time from about 5 to 10 hours subsequent to machining the ceramic surface. The Examiner failed to point out anything in the cited references that teaches or suggests this limitation that was in claim 18 that teaches annealing at a controlled temperature between about 1500 degrees C to 1600 degrees C for a time from about 5 to 10 hours subsequent to machining the ceramic surface. For at least these reasons, claim 12 is not made obvious by Herchen in view of Aihara I or Aihara II or in view of Aihara I or Aihara II and in further view of Maydan (5,746,875) and Chen (5,824,605).

Regarding the rejection of claim 1 over Schneider in view of Aihara I or Aihara II, claim 1 has been amended to recite that the portion includes at least one of Si_3N_4 and SiC. It would not be obvious to provide the invention as recited in claim 1, where the portion is made of at least one of Si_3N_4 and SiC and further annealing after the machining. Aihara I teaches away from annealing a portion made of Si_3N_4 and SiC. Col. 4, lines 8-18, of Aihara I teaches that bodies made of Si_3N_4 and SiC do not have corrosion resistance and therefore the

annealing process of Aihara I could not be applied to parts made of such substances.

Therefore, Aihara I teaches away from the use of annealed Si₃N₄ and SiC.

Schneider fails to remedy this deficiency, since Schneider does not teach annealing Si₃N₄ and SiC. For at least these reasons, claim 1 is not made obvious by Schneider in view of Aihara I or Aihara II.

Regarding the rejection of claim 12 over Schneider in view of Aihara I or Aihara II, claim 12 has been amended to incorporate the limitations of claim 18 that recite that the annealing is at a controlled temperature between about 1500 degrees C to 1600 degrees C for a time from about 5 to 10 hours subsequent to machining the ceramic surface. The Examiner failed to point out anything in the cited references that teaches or suggests this limitation that was in claim 18 that teaches annealing at a controlled temperature between about 1500 degrees C to 1600 degrees C for a time from about 5 to 10 hours subsequent to machining the ceramic surface. For at least these reasons, claim 12 is not made obvious by Schneider in view of Aihara I or Aihara II.

Regarding the rejection of claims 1 and 12 as being anticipated by or obvious under Wicker I, Wicker I does not disclose or make obvious the annealing of a machined surface, after the surface is machined, as recited in claim 1. Nothing in Wicker I suggest this. Wicker I describes sintering a powder into a GDP body. The invention may then have the sinter body machined, which creates micro-defects. A subsequent annealing after the machining is used to substantially eliminate the micro defects. The declaration of Anthony Ricci, which was submitted on June 6, 2003, states that the process of sintering a gas distribution plate as taught in Wicker I does not provide the same device as recited in claims 1 and 12, where the annealing is performed after machining. In addition, claim 12 further recites that the annealing is at a controlled temperature between about 1500 degrees C to 1600 degrees C for a time from about 5 to 10 hours subsequent to machining the ceramic surface. This time period is not disclosed or suggested by Wicker I. For at least these reasons, claims 1 and 12 are not anticipated or made obvious by Wicker I.

Regarding the rejection of claims 1 and 12 as being obvious under Wicker I in view of Wicker II and Chen and further in view of applicant's description of the prior art, Wicker I, Wicker II, Chen, and the applicant's description of the prior art do not disclose or make obvious the annealing of a machined surface, after the surface is machined. Sintering as

disclosed in Wicker I and Wicker II is not the same as annealing and provides different results. Enclosed is a copy of the USPTO CLASSIFICATION DEFINITIONS for Class 419. In Section IV-Glossary, Sintering is defined as including the union of finely divided material or powder by the action of heat with or without power. In the description of subclass 29 entitled "Subsequent heat treatment, (e.g., annealing, etc.):" annealing is described as a process subsequent to sintering. Therefore USPTO usage recognizes that sintering is different than annealing. Although the Wicker I, Wicker II, Chen, and applicants description of the prior art may disclose or suggest sintering, they do not disclose annealing as recited in claims 1 and 12. This is in agreement with the declaration of Anthony Ricci, which was submitted on June 6, 2003, states that the process of sintering a gas distribution plate as taught in Wicker I does not provide the same device as recited in claims 1 and 12. The Examiner stated that the applicant's prior art teaches seasoning a GDP in a reactor for 10 hours. Such seasoning described in the last paragraph of page 2 of the application is done by running the plasma apparatus 100. This requires 10 hours of RF and flowing gases, but does not raise the temperature of the GDP above 1500 degrees C. Therefore the applicant's prior art does not provided an annealed GDP. Therefore these references do not further disclose or suggest annealing a portion of Si_3N_4 and SiC, as recited in claim 1 as amended and do not disclose or suggest annealing at a temperature of between about 1500 degrees C to 1600 degrees C for a time from about 5 to 10 hours, as recited in claim 12. For at least these reasons, claims 1 and 12 are not made obvious by Wicker I, Wicker II, Chen, and applicants description of the prior art.

Dependent claims 2, 4-7, 11, 13-14, 18, 40, and 43-45 are also patentably distinct from the cited references for at least the same reasons as those recited above for independent claims, upon which they ultimately depend. These dependent claims recite additional limitations that further distinguish these dependent claims from the cited references. For example, claim 2 further recites that the micro-defects are substantially eliminated before implementation within the semiconductor fabrication apparatus. In addition, claims 18 and 44 further recites a second machining of only the ceramic surfaces that are not exposed to the plasma is performed after the annealing. For at least these reasons, claims 2, 4-7, 11, 13-14, 18, 40, and 43-45 are not unpatentable over the cited references.

In view of the foregoing, Applicants believe that all pending claims are allowable and respectfully requests a Notice of Allowance for this application from the Examiner. Should

the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

No fees are believed due in connection with the filing of this paper. However, if any fees are due in connection with the filing of this paper the Commissioner is authorized to charge such fees to Deposit Account 50-0388 (Order No. LAM1P118).

Respectfully submitted,
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